EURASIAN-AMERICAN PARTNERSHIP FOR

ECOLINKS

ENVIRONMENTALLY SUSTAINABLE ECONOMIES

2004

Improving Environmental Infrastructure Through Market-Based Partnerships

www.ecolinks.org

Contents

Introduction

EcoLinks: Eurasian - American Partnership for Sustainable Economies

In 1998, the US Agency for International Development (USAID) EcoLinks Program initiated a market-based approach to development assistance in the environmental sector. Recognizing the tremendous challenge of modernizing environmental infrastructure throughout Central and Eastern Europe and Eurasia, EcoLinks promotes collaboration between the public and private sectors to identify and remedy environmental problems, adopt new technologies, institute best practices in environmental management, and increase trade and investment through business partnerships.

As a result of EcoLinks assistance, progress toward improved environmental performance has been achieved not by isolated interventions, but through the sustained efforts of regional and US partners from the private sector. This report outlines the contributions of the EcoLinks program and reports on resulting improvements in environmental infrastructure in four key sectors: water, waste management, cleaner production, and climate change.

The Development Challenge: Improving and Financing Environmental Infrastructure

Forty years of centralized planning created a devastating legacy of environmental degradation in the Central and Eastern Europe and Eurasia region. While the record shows that market reforms and institutional strengthening have improved environmental quality during the 1990s, most countries in the region remain burdened with a failing and inefficient public infrastructure and a similarly outmoded industrial base. Throughout the region, municipalities lack modern water and waste management services, and outdated production processes restrain private sector growth.

In addition to a legacy of environmental neglect, the countries of Central and Eastern Europe face the time sensitive challenge of implementing infrastructure improvements requisite to joining the European Union (EU). All present and future members of the European Union must commit to implementing and enforcing EU regulations, including those associated with environmental quality and pollution prevention and control. Eight EcoLinks countries will enter the European Union this year, and Bulgaria and Romania are proposed to join in 2007. The European Commission estimates that the costs of achieving environmental compliance are as high as $130 billion at the regional level, with large infrastructure investments forecasted in the water, wastewater, and solid waste sectors.

The countries in Eurasia and Southeast Europe, on the other hand, have no similar political motivation to invest in environmental infrastructure. Their environmental improvement needs are nonetheless apparent, as outmoded infrastructure and industrial resources remain persistent stumbling blocks to both economic growth and improved environmental performance. Russia and the other Eurasian economies rely heavily on agriculture and the mining and petroleum industries, which have left in their wake enormous amounts of contaminated water and degraded land. An additional concern throughout the former Soviet Union is heavy pollution resulting from Cold War-era armament production. Development agencies, such as the World Bank, European Bank for Reconstruction and Development (EBRD), and USAID, view this situation in near-crisis proportions because these environmental pressures are affecting fundamental health and livelihood issues and preventing essential economic growth.

EcoLinks Presence Countries*

Bosnia and Herzegovina
Bulgaria
Croatia
Czech Republic
Hungary
Kazakhstan
Kyrgyzstan
Poland
Romania
Tajikistan
Uzbekistan

**EcoLinks Technology representatives provide services in these countires. Quick Response Award grants are available in additional countries in the region.*

Highlights of 2003

In 2003, the EcoLinks program paved the way for more than $11.5 million in **Technology Transfer** transactions between US environmental technology firms and organizations in the region. In November alone, EcoLinks played a key collaborative role in four environmental "tech transfer" transactions in Poland in the wastewater sub-sector valued in excess of $1.3 million. Eighty-eight grantees qualified for Quick Response Awards (QRA) to promote trade opportunities in 15 additional countries.

One success in the area of **Capacity Building** was the *Environmental Trade and Business Facilitation Seminar*, held in June 2003. Prior to this event, Adriana Mircea, the EcoLinks Technology Representative in Bucharest, and American staff collaborated to provide project preparation assistance to Romanian project sponsors in the energy, mining, and municipal water sectors. As a result of this assistance, project sponsors were able to present detailed information regarding their projects to 70 Romanian government representatives, selected US energy and environmental businesses, and international financial institutions. Business partnerships resulting from these meetings will report results as projects are implemented.

By the end of 2003, EcoLinks Technology Representatives had expanded their local Environmental Business Networks comprised of environmental companies and trade associations to more than 250 members in each of seven countries in Eastern Europe and Eurasia. EcoLinks' domestic network of environmental technology firms and trade associations also grew in 2003 to more than 1,500 members. EcoLinks attracted the attendance of more than 120 European and Eurasian companies at environmental partnering events in the United States. Nine additional ***Best Practices*** resulting from project assessments were compiled and published.

EcoLinks Environmental Technology representatives continued to promote environmental **Trade and Investment** opportunities, identifying more than a dozen waste-to-energy and renewable projects that were presented at the US Trade and Development Agency's (USTDA) Waste-to-Energy Conference in Prague in December 2002. Many of these projects received USTDA feasibility study funding in 2003. Additionally, a recent survey of EcoLinks grant recipients from 1999-2003 determined that 88 percent of the partnerships established through Challenge Grants are continuing beyond grant-funded activities. The survey results indicate that the level of trade and investment is likely to grow in the future, as EcoLinks partners secure additional resources to invest in the environment.

The EcoLinks Approach

The Market for Environmental Technologies and Services

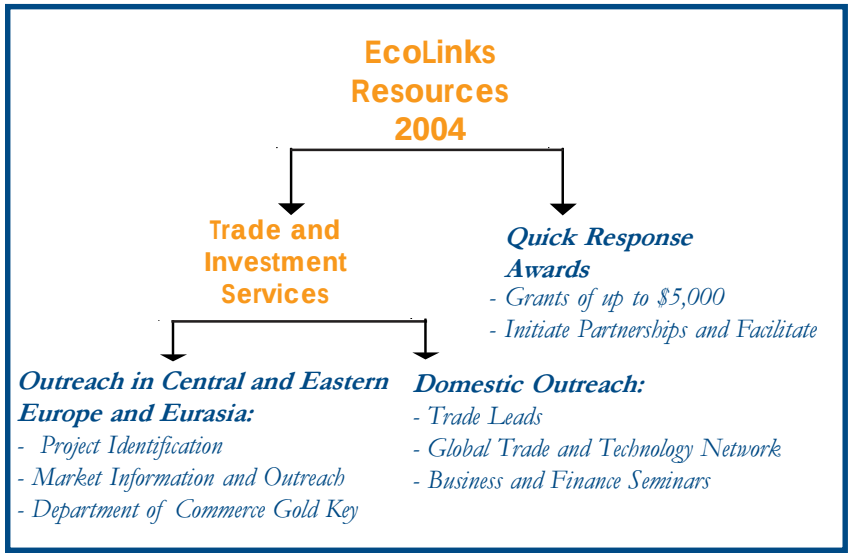
As leaders in developing innovative environmental technologies, US firms export $22.4 billion in environmental goods and services annually, supporting some 136,000 - 155,000 domestic jobs. Nevertheless, exports represent only about 11 percent of US environmental sector output while other industrialized countries export closer to 20 percent of their environmental technology production.

The demand for improved environmental technologies in Central and Eastern Europe and Eurasia is growing at a rapid and sustained pace. According to US Department of Commerce statistics, in the period 1997 – 2001, the environmental technologies market grew by 36 percent in the region, reaching $10.3 billion per year by 2001.

The EcoLinks approach is based on a philosophy that environmental problems can be solved through market-based partnerships between private sector businesses, local governments, and financial institutions. By helping organizations overcome market barriers caused by geography, lack of knowledge or environmental expertise, or poor access to financing, EcoLinks promotes capacity building and partnerships for environmentally-sound economic growth.

Resources

To implement the EcoLinks mission, USAID employs a series of related tools. EcoLinks provides trade and investment services to organizations in Central and Eastern Europe, Eurasia, and the United States and awards grants to encourage partnerships. Specific services are described below.



Trade and Investment

Information about local needs, new environmental projects, and project financing is a key element in initiating successful partnerships aimed at solving environmental problems. EcoLinks Environmental Technology Representatives work with a network of local businesses, organizations, and municipal leaders to identify and promote environmental projects in Bulgaria, Bosnia and Herzegovina, Croatia, Czech Republic, Hungary, Kazakhstan and in Central Asia, Poland, and Romania.

Bulgaria

The growth of the environmental technologies and services market in Bulgaria is expected to increase over the next ten to fifteen years, as Bulgaria requires significant investments in environmental infrastructure to comply with EU environmental regulations. The market demand for waste management technologies and services is especially high; recent estimates of the costs of investments for the waste sector in Bulgaria alone reach more than $2.5 billion. EcoLinks Environmental Technology Representative Stanislava Dimitrova works with municipal and business leaders to identify priority projects and potential US partners. Ms. Dimitrova has assisted both small, specialized service providers and larger, full service firms to conduct work in the environmental sector.

"Thanks to Ms. Dimitrova and her EcoLinks colleagues' full support, we could find the best solution to our environmental problem and thus, I hope we will be even more competitive in domestic and international, complying to all world standards in environment protection."

Spas Spasov
Executive Director
Zagaria, Stara Zagora, Bulgaria

Central Asia

Safe drinking water, improved waste management, and cleaner industrial production are all key development priorities in Central Asia. As the EcoLinks Environmental Technology Representative in Almaty, Nurlan Zhangarin leads EcoLinks initiatives in Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyzstan. Due to high levels of resource intensive industry, environmental management and cleaner production processes in the petroleum and mining sectors are of particular interest in this region. Before joining EcoLinks, Mr. Zhangarin worked as a technical specialist in the environmental sector for several USAID programs.

"EnSafe Inc. is developing several environmental projects in Kazakhstan, and constant help from the EcoLinks program and personally from Nurlan Zhangarin has eased the implementation of these projects."

Anuar Aikynbayev
Senior Vice President
EnSafe, Kazakhstan

EcoLinks Environmental Technology Representatives work locally to determine environmental technology needs, prepare International Market Insights and Industry Sector Assessments, and offer *Gold Key Services* and matchmaking opportunities for US businesses. The *Gold Key Service* offers US firms appointments with pre-screened and pre-qualified local business representatives. EcoLinks Technology Representatives have also hosted US environmental firms in their countries and arranged matchmaking meetings at local trade shows, promoting a greater awareness of US technologies.

Domestically, EcoLinks offers additional trade and investment services, linking regional projects and clients with appropriate US partners and sources of additional finance. The first step in this process is the dissemination of trade leads, based on the assessment of viable environmental projects in the region and the US environmental technology market. Project technology needs from the field are communicated through EcoLinks and its implementing partners who match needs with US companies.

EcoLinks' domestic team then shares trade and investment opportunities with US companies and financial institutions at events in the United States and in the region. During 2003, EcoLinks organized major environmental matchmaking events in the United States in Tucson, Dallas, Wilmington (DE), Los Angeles, Denver, and Washington, DC; and in Bulgaria, Croatia, Czech Republic, Hungary, Poland, and Romania. These events hosted more than 200 international delegates with environmental projects and paired them with appropriate US environmental technology firms. At these gatherings, the EcoLinks team organizes seminars, technology site visits, and matchmaking meetings that promote dialogue between prospective partners.

Trade and Investment Outreach Events in 2004

Feb. 26-27	*Bulgarian Building Energy Efficiency Conference* Sofia, Bulgaria
Feb. 26-27	*EcoLinks Annual Environment and Clean Energy Trade Events* Washington, DC, USA
Mar. 1-3	*EcoLinks Matchmaking and Seminar at POWER-GEN Renewables 2004* Las Vegas, NV, USA
Mar. 18-19	*Water Quality Association Annual Expo and Conference* Baltimore, MD, USA
Apr. 14-17	*EcoLinks Danube Region Mine Tailings Management Seminars* Bucharest, Romania
Apr. 20-24	*Envi Brno 2004* Brno, Czech Republic
May 18-20	*EcoLinks Delegations to Waste Expo 2004* Dallas, TX, USA
May 19-20	*EcoLinks Central Asia Business Event* Almaty, Kazakhstan
May 25-27	*Prague Water and Sewer Systems Trade Show* Prague, Czech Republic

EcoLinks Partnership Grants

Grants build the capacity of regional firms and organizations to identify and implement projects and provide start-up funds for partnerships between American and regional partners or partners within the region. EcoLinks has employed three types of grants to encourage partnership building and project implementation: Quick Response Awards, Challenge Grants, and Follow-on Financing Grants.

Quick Response Awards (QRAs) are a central to the EcoLinks assistance model, and have been awarded since 1999. With a value of up to $5000, QRAs are awarded to cover travel costs to facilitate environmental partnerships through face-to-face business meetings and attendance at environmental technology trade shows in the US and in Central and Eastern Europe and Eurasia. In 2003, 88 QRAs were awarded to promote trade opportunities between regional organizations and US businesses and organizations. EcoLinks continues to grant Quick Response Awards in 2004.

From 1999 – 2002, EcoLinks awarded *Challenge Grants* of up to $50,000 that supported one-year, cost-shared projects. Over the course of the program, Challenge Grants partnerships have implemented 187 cooperative projects, representing a significant transfer of technology and accumulation of expertise developing innovative approaches to solve local environmental concerns. In 2002, EcoLinks introduced *Follow-on Financing Grants* of up to $10,000 to assist the most promising Challenge Grantees in obtaining private sector financing to implement recommendations and follow-up measures of successful Challenge Grant projects.

EcoLinks Grants 1999-2003

	Number of Awards	Total (US$)
Quick Response Awards	493	$1,971,067
Challenge Grants	187	$8,682,381
Follow-on Financing Grants	6	$51,013
TOTAL	686	$10,704,461

The EcoLinks Implementation Team

The EcoLinks program currently draws on four organizations to implement its core activities. The Institute of International Education (IIE) manages EcoLinks Grants program and TCG International coordinates market outreach and trade facilitation services. Both partners rely on

Croatia

Mirjana Matesic is the Environmental Technology Representative based in Zagreb providing EcoLinks services in Croatia, Bosnia and Herzegovina, and Slovenia. Upgrading environmental infrastructure in the energy, water, and waste management sectors is essential to resumed economic development in this region, and Ms. Matesic encourages US companies to enter the market by providing substantive market research and analysis of developments within the environmental sector. Prior to joining EcoLinks, Ms. Matesic worked in the private sector for five years as an environmental specialist in the food industry, where she managed the introduction of environmental management systems and ISO 9001 and 14001 certifications.

"Mirjana Matesic has been instrumental in making it possible for Texas businesses to compete for hundreds of millions of dollars worth of environmental infrastructure projects in Croatia and Bosnia and Herzegovina. She has played a vital role in helping the Texas business community join with the people of Croatia and Bosnia and Herzegovina as partners in development."

Carl H. Isett
Texas State Representative, District 84

Czech Republic

Based in Prague, EcoLinks Environmental Technology Representative. Veronika Lukešová provides commercial services to US businesses interested in entering or expanding their environmental market in the Czech Republic. The country's entry into the EU this year should not only accelerate economic restructuring, but also create many opportunities for environmental suppliers, with major investments needed in both the public and private sector over the next five to ten years. Ms. Lukešová offers US businesses access to this expanding market, through services such as the Commercial Services *Gold Key* and market counseling. Ms. Lukešová has earned her master's degree from the Faculty of Social Sciences of Charles University, Prague.

"Thanks for your arrangement of our Gold Key meeting in Prague. It was a good step in the Czech market and we got what we were looking for. I certainly will recommend it to everybody from the US who is interested in making a step towards the Czech market!"

Frank Schilbach
Sorbent Products (SPC) International
New Jersey

an Internet platform designed and managed by the Global Environmental Technology Foundation (GETF). As a partner to the EcoLinks program, USAID's Global Trade and Technology Network (GTN) disseminates EcoLinks trade leads to the more than 5,000 US environmental and energy companies registered in the GTN database.

Inter-Agency Partnership—The US Department of Commerce

EcoLinks provides trade and investment services through a partnership between USAID and the US Commercial Service of the Department of Commerce (DOC). EcoLinks Environmental Technology Representatives are stationed at US Commercial Service posts located in US embassies in seven countries and provide core services such as project identification, trade lead dissemination, market analysis, and business counseling. EcoLinks' domestic outreach efforts draw upon the support of DOC's Export Assistance Centers located in more than 100 locations throughout the United States. Export Assistance Centers assist EcoLinks trade delegations by facilitating meetings with US firms. EcoLinks also cooperates with DOC's International Buyer Program at major environmental trade shows.

Alliances to Leverage Resources

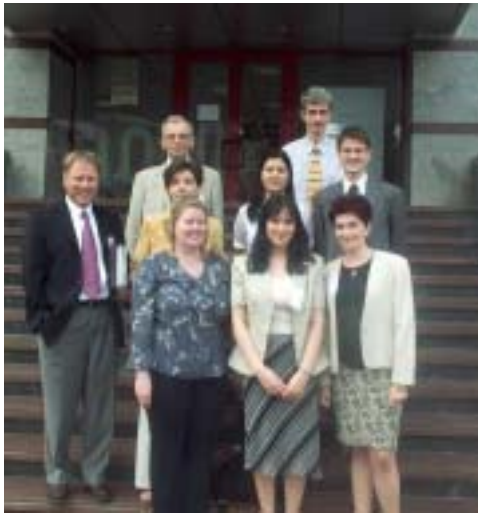
The EcoLinks staff in the United States, Central and Eastern Europe, and Eurasia does not work alone. In addition to the hundreds of US and regional companies, municipalities, and trade organizations that have forged partnerships with the assistance of EcoLinks, there are several key institutional partners—both in the United States and in the region—that contribute to achieving the program's objectives.

The Northwest Texas International Trade Center, a state funded export promotion organization offers a prime example of successful collaboration between EcoLinks and state government organizations. Combined efforts have assisted companies with expertise in environmental remediation, water treatment, and waste management sectors that serve environmental markets in Croatia and Bulgaria.

The *US Trade and Development Agency (USTDA)* actively supports environmental projects in Central and Eastern Europe, with a particular focus on environmental infrastructure in renewable energy and waste-to-energy projects. EcoLinks Environmental Technology Representatives play an instrumental role in USTDA efforts in each EcoLinks country by identifying viable environmental projects and organizing country delegations for USTDA outreach events and conferences.

The *US Export-Import Bank (ExIm)* provides loans and loan guarantees for the purchase of US exports. The US ExIm Bank and private sector banks offering ExIm products in Central and Eastern Europe and Eurasia have participated in EcoLinks events in Romania, Croatia, and the United States to share information about loan products available to finance environmental projects.

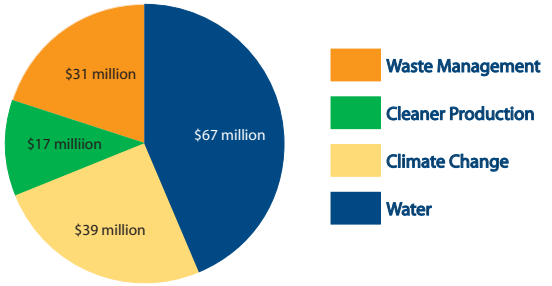
EcoLinks works closely with partners in Eastern Europe and Eurasia who are leaders in disseminating clean environmental technologies to municipalities and businesses. In Romania, EcoLinks partnered with the *Institute of Power Studies and Design* in Bucharest to host the *EcoLinks Environmental Business Facilitation Seminar* in June 2003.



ISPE and EcoLinks staff and partners meet in Bucharest.

Improving Environmental Infrastructure

EcoLinks Trade and Investment Results by Sector (1999-2003)



EcoLinks targets assistance to local and regional priorities. This chart presents the combined value of the trade in environmental technologies and the value of additional project investment reported as a result of EcoLinks assistance, according to sector priorities.

Transition to a market economy has brought tremendous environmental improvements to the countries of Central and Eastern Europe, the first of whom will enter the European Union in May, and Eurasia. Many of the immediate environmental benefits, however, are the consequences of economic restructuring and the regional economic recession which decreased industrial output throughout the decade. As economic growth resumes in the region, long-term environmental improvements require investments to improve public services and private sector production facilities.

As part of joining the European Union, the countries of Central and Eastern Europe must meet their obligations as the Member States. In terms of EU environmental law, most country obligations can be found in the EU directives, which impose specific requirements across a range of sectors including air and water, solid waste, and integrated pollution prevention and control (IPPC). Southeast European countries will likely face higher levels of investment needs when, and if, they join the European Union and Eurasian countries, though not joining the EU, also face similar challenges.

EcoLinks has focused its support on four key sectors and achieved results that contribute to regional priorities. As a result of this assistance, private sector and municipal partnerships have invested $154 million in the environmental sector in Eastern Europe and Eurasia in the period 1999-2003.

EU Environmental Directives Requiring Major Investments

Water and Wastewater Treatment
- Urban Wastewater Treatment Directive
- Drinking Water Directive
- Dangerous Substances into Water Directive
- Nitrates Directive

Waste Management
- Landfill Directive
- Municipal Waste Incineration Directive
- Hazardous Waste Incineration Directive
- Packaging Waste Directive

Air Pollution Control
- Large Combustion Plant Directive
- Fuel Quality Directive
- Air Quality Directive

Industrial Pollution Control
- Integrated Pollution Prevention and Control (IPPC) Directive
- Volatile Organic Compounds (VOC) Directive

The cost estimates of achieving compliance with EU directives for environmental quality, $100-130 billion according to recent estimates, provide an indication of the scale of investments required in environmental infrastructure in Central and Eastern Europe. Source: Communication from the European Commission, COM (2001) 304 final.

Window of Opportunity for Environmental Investments

Due to the massive investment required to modernize existing water infrastructure, EU candidate countries have negotiated binding transition periods during which necessary environmental improvements must be made. The transition periods reflect the type and scale of environmental investment required in each country. Bulgaria, Czech Republic, Hungary, and Poland have all negotiated transitional periods at least through 2010 to implement the Urban Wastewater Treatment Directive. Achieving compliance with this directive will require investments in wastewater collection and treatment systems, water quality monitoring, and modeling systems. The primary investors will be municipalities, municipal water companies, and industry.

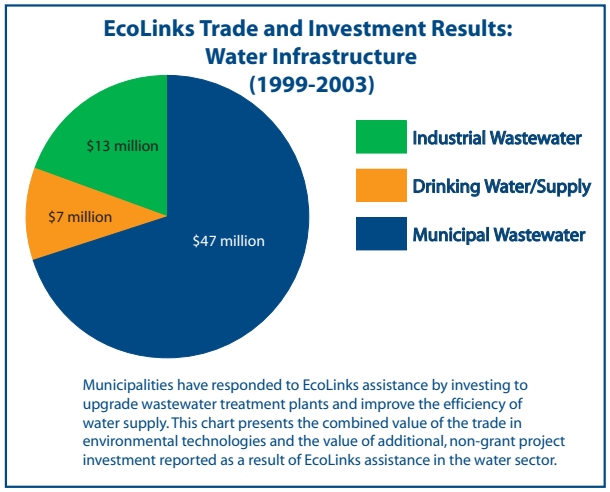
Best Available Technology for Water Pollution Control

GreenTechTexas International specializes in environmentally sustainable systems for sanitation and water pollution control. GreenTechTexas collaborated with EcoLinks Technology Representative Anna Janczewska to assess market potential and to develop a marketing plan for pollution control systems in Poland.

As a result of EcoLinks assistance, GreenTechTexas technology was installed on a test basis in Poland before the heavy flooding season of the summer of 2002. The success of the system's ability to limit pollutant levels has led to further orders and recognition. GreenTechTexas' system received the Polish National Government certification as *Best Available Technology* (BAT) in 2003, opening the door for other municipalities to introduce this system to comply with relevant Polish and EU environmental technology standards.

Malgorzata Witczewska, Deputy Director of Environmental Services, the City of Plock, inspects the installation of GreenTechTexas' EcoDrain storm water filtration system.

Water



Municipalities have responded to EcoLinks assistance by investing to upgrade wastewater treatment plants and improve the efficiency of water supply. This chart presents the combined value of the trade in environmental technologies and the value of additional, non-grant project investment reported as a result of EcoLinks assistance in the water sector.

The United States is investing to improve the sustainable management of fresh water resources and accelerate international efforts to achieve the UN Millennium Declaration Goal of reducing the proportion of people without access to safe drinking water by 50 percent by the year 2015. In particular, USAID is providing support to improve water management in three key areas: access to clean water and sanitation services, improved watershed management, and increased productivity of water.

The EcoLinks program addresses these issues in Central and Eastern Europe and Eurasia by promoting investments in municipal infrastructure for drinking water and wastewater treatment and assisting private sector industries to reduce effluent pollution levels. Industries and municipalities in the water sector have responded to EcoLinks support by mobilizing additional investments of more than $67 million in commercial trade and post-grant investments. The most important sub-sector is municipal wastewater, where EcoLinks has prepared the way for nearly $47 million in trade and investment.

EcoLinks wastewater projects include the installation of pipes, wastewater treatment technologies, and urban water run-off pollution control technologies. For example, Bioscience Inc. is a manufacturer of enzymes used to promote growth of bacteria for biological wastewater treatment. Through EcoLinks outreach assistance provided by Mirjana Matesic in **Croatia**, BiEco—a Croatian firm active in the biological treatment field—purchased wastewater treatment products from Magyar Viztechnika, Biosciences' Central European dealer in **Hungary**. Magyar Viztechnika initiated its own relationship with Bioscience as a result of an EcoLinks QRA-funded trade visit to Bethlehem, Pennsylvania, site of Bioscience's lab and production facilities. These projects, implemented through EcoLinks' business transactions or by grant partners, clearly support local efforts to fulfill EU regulations in the water sector.

Best Practice for Improved Municipal Water Management, Bosnia and Herzegovina

Project Title: Unaccounted-for Water Reduction Plan
Leader: Water and Sewage Utility, Konjic, Bosnia and Herzegovina (BiH)
US Partner: Valu Add Management Services, (North Andover, MA USA)
Local Partner: Hydro-Engineering Institute, (Sarajevo, BiH)
Location: Konjic, Bosnia and Herzegovina
Project Duration: January 2002 – January 2003
Total Project Investment: $94,774; EcoLinks Grant Support: $49,894

With the assistance of an EcoLinks Challenge Grant, the Municipality of Konjic developed a five-year, water-loss reduction plan and introduced a pay-for-consumption tariff system for industrial users. Environmental benefits of the project include reduced water losses of 70,000 cubic meters in the first year. Economic benefits include reduced operational costs and increased revenues through improved metering of consumers totaling $600,000 per year.

EcoLinks staff and water sector partners at an environmental trade fair in Poland.

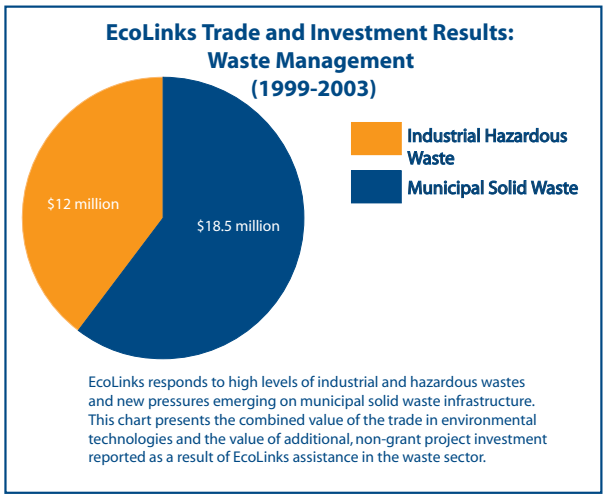
Waste Management

Bio-Composter Technology Installed and Produced in Poland

Bapic, Inc., a Virginia based manufacturer of rotary bio-composters, and Ekobud, a leading solid waste management company in Poland, have developed a successful environmental business partnership with EcoLinks assistance. Following an EcoLinks-supported State of Virginia Reverse Trade Mission, Ekobud secured an EcoLinks Quick Response Award (QRA) to return to Virginia to visit Bapic headquarters where representatives signed a distribution agreement to introduce Bapic's bio-composter technology in Poland. After successful installation of one bio-composter unit at the Ekobud facilities in central Poland, Ekobud developed its own production capacity. The Polish-American equipment has already been installed in Slupsk in northern Poland.

The EkoBud project team installs Bapic's bio-composter in Slupsk.

Because waste is a by-product of economic production and human consumption, environmental pressures caused by waste streams are linked directly to economic growth, industrial efficiency, and the population's standard of living. In Central and Eastern Europe, industrial and hazardous waste levels have been historically high, due to inefficient production processes, whereas municipal waste streams during the 1990s remained about half the level of European Union countries, reflecting lower living standards. As economic growth increases in the countries in the region, so do the municipal waste streams and environmental pressures.



EcoLinks responds to high levels of industrial and hazardous wastes and new pressures emerging on municipal solid waste infrastructure. This chart presents the combined value of the trade in environmental technologies and the value of additional, non-grant project investment reported as a result of EcoLinks assistance in the waste sector.

As a result of EcoLinks assistance, municipalities and industries have invested more than $30 million in waste management projects. Moreover, many EcoLinks projects are already at work to reduce the total investments required to address waste concerns by building the capacity of local partners to develop cost effective approaches to waste management such as improved recycling, bio-composting, and the conversion of waste to energy. For example, EcoLinks Environmental Technology Representatives in **Poland, Czech Republic, and Hungary** have identified local project sponsors interested in US technologies to convert organic waste feedstock into clean energy.

Transition Periods to Achieve EU Standards in Waste Management		Deadline
Bulgaria	Recovery and recycling of packaging waste	2011
	Landfill of certain liquid wastes	2014
Czech Republic	Recovery and recycling of packaging waste	2005
Hungary	Recovery and recycling of packaging waste	2005
	Incineration of hazardous waste	2005
Poland	Recovery and recycling of packaging waste	2007
	Waste landfills	2012

Innovative Approach to Improved Solid Waste Management in Macedonia

Zrnovci, Macedonia, is experiencing an environmental and public health crisis due to poor municipal solid waste management. McGill Environmental Systems is a North Carolina firm specializing in the design and construction of Integrated Solid Waste Management (ISWM) plants and composting systems. In support of the USAID Mission in Macedonia's *Community Self Help Initiative*, EcoLinks matched McGill Environmental Systems with the USAID Mission in Skopje. Working with seed funds provided by an EcoLinks Quick Response Award, McGill Environmental Systems and local officials have recently begun developing a cost-effective Integrated Solid Waste Management system. This project opens the opportunity for technology transfer and is specifically designed in a manner that promotes local participation, as ISWM components can be engineered and produced locally.

McGill Environmental Systems works with the town of Zrnovci to manage waste from livestock.

Managing waste will be one of the most costly of all environmental challenges for countries in the region. EU Candidate countries have negotiated transition periods for several directives, including ones for packaging waste, landfills, and hazardous wastes (see chart.) Heavy investments in these areas will be required for municipal landfill sites, the closure of old landfills, municipal waste incinerators, and hazardous waste collection and treatment. Primary investors will be municipalities, waste utilities, and industry.

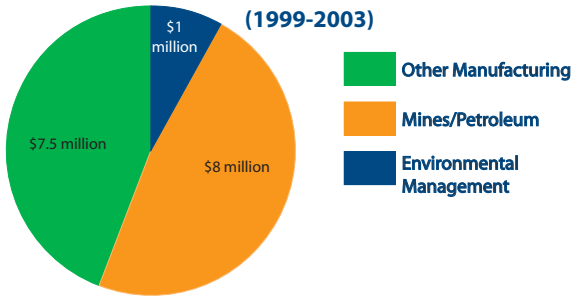
In **Romania,** where EU negotiations have not been finalized, estimates of the level of investments required in the waste sector range from $3.2 – $7 billion over the next 10 years. In response to this challenge, Swanson Environmental Management Systems Inc. (SEMSI), a small business in Colorado, partnered with the Municipality of Iasi, Romania, to establish a Solid Waste Recycling department through an EcoLinks Challenge Grant. SEMSI's assistance to the local government agency responsible for solid waste collection enabled the department to initiate a market-driven, paper recycling program, as well as to introduce local policies that encouraged the private sector to recycle.

Cleaner Production

Cleaner Production is an internationally recognized term for reducing the environmental impacts of industrial and other production processes. The concept is linked very closely to and builds upon pollution prevention techniques and life-cycle pollution analyses. Cleaner production is applied at the firm level, affecting the entire scope of the business enterprise. In Europe, cleaner production is incorporated in the Integrated Pollution Prevention and Control (IPPC) Directive, which is intended to expedite the adoption of new production processes, cleaner technologies, pollution control systems, and environmental health/accident prevention measures. Included in the discussion here are efforts to introduce and adopt Environmental Management Systems, which provide a framework in which to implement cleaner production techniques.

Mining sites throughout the region, like the one pictured above in Deva, Romania, are investing in cleaner production processes.

EcoLinks Trade and Investment Results: Cleaner Production (1999-2003)



EcoLinks projects have assisted industries throughout the region to adopt best practices in cleaner production and trained staff in environmental management techniques. This chart presents the combined value of the trade in environmental technologies and the value of additional, non-grant project investment reported as a result of EcoLinks assistance for cleaner production.

Cleaner production represents both a challenge and an opportunity for firms in Central and Eastern Europe and Eurasia. Because cleaner production requires modernizing equipment and training staff, implementing cleaner production through all levels of production requires a significant short-term investment. However, the production efficiency gains and waste minimization that result from cleaner production also represent tremendous long-term cost-savings and avoided regulatory costs. For this reason, EcoLinks projects, resulting in more than $17 million in trade and investment, have focused on introducing cleaner production techniques that provide both environmental and economic benefits.

California Firm Expands Sales of Silver Recovery Technology in Central and Eastern Europe

In addition to being a precious metal, silver is a toxic waste product of commercial processes such as printing, photography, and chemical processing. With cost-effective technology, silver recovery can be a self-financing investment with a short payback period. Canadian Silver Recovery Service, Inc. (CSRS) is a leader in re-circulation silver recovery technology for photography, printing, and medical X-ray processing operations.

Following successful projects in **Poland**, CSRS has expanded its Central European business into **Czech Republic**, with the assistance of Veronika Lukešová, EcoLinks Environmental Technology Representative in Prague. CSRS has developed a partnership with the Czech firm, Rentgen Servis Priborsky, the leading service firm for photographic appliances in the Czech states of Northern Moravia and Silesia. Additional market demand has recently been identified in **Ukraine** and **Russia.**

A recent example of cleaner production in **Croatia** involves the Salonit Cement Company, a major polluter in the city of Split on the Adriatic coast. As a result of business matching services provided by Environmental Technology Representative Mirjana Matesic, a US firm has provided engineering and research services leading to an initial $2 million investment by Salonit to introduce cleaner production processes that eliminate the use of asbestos at the factory. As a result, Salonit will be able to increase and diversify production capacity while meeting local environmental regulations.

Valeo, a manufacturer of athletic shoes in **Bulgaria**, approached BEM Systems, Inc., headquartered in New Jersey, for assistance in decreasing its volatile organic compound (VOC) emissions as part of an EcoLinks Challenge Grant. BEM and Valeo staff worked together in assessing production and product quality issues, VOC production, and the handling of hazardous materials. As a result of their work, more than 400 Valeo employees were trained in a variety of environmental management practices. With this base of experience, Valeo is now implementing a cleaner production approach to manufacturing at its facilities.

Climate Change

Though difficult on the people of the region, recession and restructuring of the economies of Central and Eastern Europe and Eurasia during the 1990s had the positive effect of decreasing emissions of carbon dioxide (CO_2), the primary greenhouse gas. Recent trends and projections, however, indicate that emissions are beginning to rise and, in some countries, could return to pre-transition levels under "business as usual scenarios" by 2008. The primary variables for projecting CO_2 emissions level scenarios are: GDP growth; energy prices; energy intensity of GDP; and the introduction of new technologies to the market.

In this context, the goal of countries throughout the region is to separate economic growth from increased CO_2 emissions. The most effective way to do this is through increased energy efficiency in the production, distribution, and consumption of fossil fuels, and the replacement of fossil fuels, where possible, with renewable sources of energy. EcoLinks-assisted projects have resulted in trade and investment of $39 million in municipal energy infrastructure, improved energy efficiency at industrial sites, and renewable energy technologies.

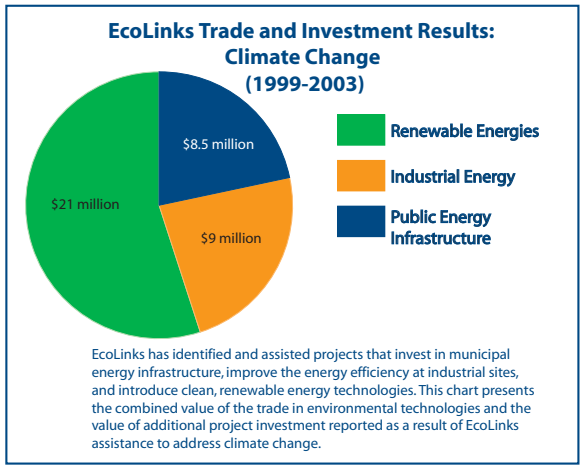
European Union regulations in the air sector focus on local and regional air pollution caused by sulfur dioxide (SO_2), nitrogen oxides (NO_x), and VOC

Best Practice in Cleaner Production: Mining in Kazakhstan

Project Title: Process Efficiency Improvements and Cyanide Recycling at Akbakai Gold Mine
Project Leader: JSC Altynalmas, Almaty, Kazakhstan
Project Partner: EnviroNet Management Systems, LLC, Arlington, VA USA
Location of Project: Akbakai, Kazakhstan
Project Duration: October 2000 - September 2001
Total Project Investment: $83,758; EcoLinks Grant Support: $49,101

The Altynalmas Gold Mine and Ore Processing Facility in Akbakai, Kazakhstan, uses cyanide to extract gold from ore. While cyanide processing is a common extraction technique, the plant was experiencing low yield levels of gold while discharging high levels of cyanide into a tailings pool. With the assistance of US partners through an EcoLinks Challenge Grant, mine managers engaged in a pre-feasibility study to determine the best approach to reducing their impact on the local environment while improving their operational efficiencies and costs. As a result, the mine implemented a partial cyanide recycling and recovery program and improved extraction methods through pressure oxidization.

emissions. Nevertheless, investments in this sector will also have secondary effects on emissions of CO_2 and other greenhouse gases. Bulgaria, Czech Republic and Poland have all negotiated transitional periods to fully implement the EU Directive on Air Pollution from Large Combustion Power Plants. Energy utilities and industries will be major investors to implement necessary improvements. In addition, the European Union has set a goal of increasing the share of renewable energies to 12 percent of gross domestic energy consumption by 2010, creating a high demand for viable wind, solar, and waste-to-energy projects. EcoLinks projects have fostered more than $21 million in renewable projects in the region already.



EcoLinks has identified and assisted projects that invest in municipal energy infrastructure, improve the energy efficiency at industrial sites, and introduce clean, renewable energy technologies. This chart presents the combined value of the trade in environmental technologies and the value of additional project investment reported as a result of EcoLinks assistance to address climate change.

In **Czech Republic**, Ekosolaris, the largest producer and supplier of solar equipment, purchased Thermafin copper sheet absorbers from Alternate Energy Technologies of Jacksonville, Florida to assure high thermal conductivity of a water heating system. As a pioneer in wind energy development, Cannon Power Corporation of California is working with local partners to build wind farms in western and northwestern **Poland.** Other examples include the conversion to natural gas power at an energy facility in **Slovakia**, and the introduction of air pollution monitoring equipment at industrial facilities in **Croatia**.

Several Best Practices have also been identified for climate change projects. In one intra-regional exchange, a **Croatian** company worked with an electric power company in **Macedonia** to develop a technical, environmental, and financial framework for rehabilitating older, hydropower plants. The project methodology can be easily transferred and implemented by other public or private organizations that produce hydropower.

In Vladivostok, **Russia,** Speczavod is the only waste-to-energy facility. Due to ineffective fly-ash containment systems, the facility was forced to operate below capacity to keep emissions within permissible levels. With the assistance of Challenge Grant partner Energy & Environmental Consulting Engineers (EECE) of California, Speczavod succeeded in reducing fly-ash emissions through the installation of new equipment and, additionally, identified a market for fly-ash itself. The team also modernized one incinerator, improving its performance and enabling it to produce more steam for residential heating use.

Best Practice: Tapping the Market for Landfill Biogas in Bulgaria

Project Title: Landfill Biogas Extraction and Energy Utilization System at the "Bratovo" Landfill in Bourgas, Bulgaria
Leader: Municipality of Bourgas (Bourgas, Bulgaria)
Partner: Brown, Vence & Associates, Inc. (BVA) (Roseville, California USA)
Location: Bourgas, Bulgaria
Project Duration: January 2000 - March 2001
EcoLinks Project Investment: Total Project Investment: $67,000; EcoLinks Grant Support: $43,000.

The Municipality of Bourgas operates the Bratovo Landfill, one of the few sanitary landfills in Bulgaria. The landfill is expected to reach full capacity in 2007. Due to the volume of the landfill, biogas emissions create health, safety, and environmental problems for the region. The Municipality of Bourgas and the US consulting firm, Brown, Vence & Associates, Inc., collaborated to conduct an assessment of Bratovo landfill biogas emissions and review options for capturing the biogas or converting it into a useable energy resource. The project promoted widespread learning about landfill biogas conversion, an untapped market thus far in Bulgaria, and established important networks for fundraising to promote the capture and use of landfill biogas.

Development Impacts

EcoLinks employs an innovative mix of low-cost tools to achieve development objectives. Through its combination of small- and medium-sized grants, market outreach, and trade and investment services, EcoLinks enables partners to achieve significant positive developmental impacts. EcoLinks partnerships achieve long-term benefits through *Capacity Building*, *Technology Transfer*, and *Trade and Investment*.

EcoLinks Best Practices in Environmental Management

As part of its long-term capacity building mandate, EcoLinks has identified Best Practices in environmental management that can be replicated throughout Central and Eastern Europe and Eurasia. Best Practices demonstrate environmentally sound and economically efficient solutions to environmental problems resulting from the successful collaboration of partnerships supported by EcoLinks Challenge Grants.

Best Practices represent methodologies and technologies that have been transferred from the United States and other countries in the region and tested under local conditions. They provide unique templates for implementing practical, market-based solutions to environmental problems that can used by other organizations.

Capacity Building

EcoLinks defines capacity building as increasing local organizations' capability to identify and address priority environmental concerns. This includes an increased ability to develop and manage projects as a result of training in environmental management systems. In keeping with EcoLinks' program mandate, capacity building activities provide organizations not only with the ability to reduce pollution through cost-effective environmental technologies, but to take on the major environmental challenges that their countries face.

The creation of an accredited environmental auditor-training facility established within the Center for Ecological Service and Expertise, Khabarovsk, **Russia** provides an example of capacity building fostered by an EcoLinks Challenge Grant. The Center, the first outside of Moscow, is now authorized by the State Committee on Environment to train environmental auditors, ensuring further sustainability of the program.

In April 2002, EcoLinks Environmental Technology Representative Stanislava Dimitrova organized a two-day Environmental Technologies Conference in Sofia, **Bulgaria** that involved more than 200 Bulgarian representatives from the government, business, and NGO communities. In order to increase local interest in the adoption of environmental management approaches, EcoLinks invited Dr. Waqi Alam of Tetrahedron Inc., a Maryland-based environmental engineering firm, to provide training on ISO 14000, an internationally recognized management framework that provides tools for organizations to improve their environmental performance.

Cherkassytransgas is one of the largest natural gas transmission companies in **Ukraine**, operating six gas pipelines from Russia and Turkmenistan through Ukraine and into Western Europe. Through an EcoLinks Challenge Grant, Indaco Air Quality Services Inc. of North Carolina and Cherkassytransgas staff worked together to assess the pipeline network for leaks using a Hi-Flow Sampler unit. The Ukrainian staff was trained in operating the Hi-Flow Sampler and Cherkassytransgas subsequently purchased a unit for its own use. They are now able to use this capability to develop their own leak mitigation plans.

Hungary

In Hungary, one of the region's leading economies, private firms and municipalities are planning significant investments in environmental infrastructure. EcoLinks Environmental Technology Representative Andrea Hajdu has worked with the US Embassy Commercial Service in Budapest, Hungary since 2000, and assumed responsibility for EcoLinks in 2002. Ms. Hajdu has worked extensively to partner Hungarian companies such as Hydrofilt and Magyar Viztechnika and the Hungarian Water Association with US firms interested in initiating or expanding their market. Prior to joining the Commercial Service, she earned her master's degree in International Relations and Diplomatic Studies at the Budapest University of Economic Sciences.

"EcoLinks staff support from Ms. Andrea Hajdu, EcoLinks representative in Hungary, was excellent… our company is still actively engaged in exploring other business opportunities as well as lending technical support to a few valuable customers who had purchased our products to solve environmental problems in their facilities."

Kosh Daphtary, President
Chemtech International Inc.
Media, Pennsylvania

Poland

Anna Janczewska is the longest serving member of the EcoLinks team, having joined the US Commercial Service in Warsaw, Poland in 1997 and the EcoLinks Program in 1999. Beginning her career in 1992 with US companies active in Poland, Ms. Janczewska is well-suited to bring Polish and US businesses together to solve local environmental problems. The environmental sector is rapidly developing in Poland, and Ms. Janczewska has assisted US companies across a broad spectrum of environmental sectors including water supply, wastewater treatment, renewable energy, and waste management. She holds master's degree in Economics from the Warsaw School of Economics.

"As a small company, the EcoLinks QRA was very instrumental in assisting our fact-finding mission and learning what we needed to know to develop this new market. The grant was helpful. More valuable to us were the people that we met. Anna Janczewska is very well respected and well connected; extremely professional. I am not sure that her value to US companies is fully recognized."

Fred Swartling, President
GreenTechTexas
Houston, Texas

Technology Transfer

Cost-saving environmental technologies represent a "win-win" proposition to municipalities and industries throughout the region. In many cases, modernizing equipment and production processes benefit the environment and the "bottom line," as cost savings are realized through increased efficiencies and reduced input costs. EcoLinks has successfully supported the transfer of environmental equipment and services to the region, including low emission gas microturbines, solar energy production equipment, groundwater and soil remediation technology, pollution control, and bioremediation simulation software.

Examples of technology transfer can be found across the four EcoLinks sectors. In the area of renewable energy, for example, EcoLinks partners have tested and introduced wind and solar power in **Poland** and **Czech Republic**. In the water sector, flood control and urban water run-off pollution control technologies have been introduced following the severe flooding of summer 2002 in both of these countries as well.

In **Hungary**, Pritech Kft., an environmental engineering and consulting firm, purchased sewage pumps from the Gorman-Rupp Company of Ohio, a leading manufacturer of municipal and industrial sewage pumps. EcoLinks Environmental Technology Representative Andrea Hajdu introduced Pritech to Gorman-Rupp, when she led a Hungarian Trade Delegation to the Water Environment Federation's Technical Exhibition and Conference in Chicago 2002.

In **Kazahkstan**, the transfer of environmental expertise through a Challenge Grant led to environmental improvements and cost savings through cleaner production at a ferroalloys plant. Project results demonstrated that by making inexpensive modifications to the smelting process, the future slag waste stream stored at the facility could be reduced by 70 percent while earning the company more than $110,000 annually in gravel sales. Project recommendations on modifying the smelting process and stabilizing slag waste can be transferred to other ferroalloys producers in Central Asia.

Environmental Technologies Adopted through EcoLinks Projects

Water
- Groundwater Remediation System
- Groundwater Samplers
- Vacuum Sewer System Valves
- Corrosion Control Chemicals for Municipal Water Supply Systems
- Hydrological Computer Models
- Leak Detection Systems

Waste Management
- Plasma Torch Technology
- Biocomposting Technology
- Soil Samplers
- Soil Remediation
- Recycling Technology
- Hazardous Waste Management Technology

Climate Change
- Air Pollution Monitoring Equipment
- Gas Turbine and Gas Compressor
- Solar Energy Equipment
- Wind Turbines
- Energy Efficiency Audits and Technology
- Biomass Utilization

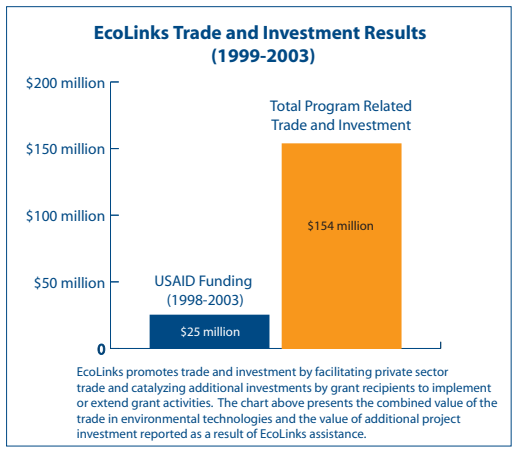
Cleaner Production
- Low-Solvent Cleaning System
- Oil Recycling Equipment
- Odor Control Products
- Briquetting Equipment
- Personal Dosimeters
- Cement manufacturing process substitution

Promoting Trade and Investment

EcoLinks initiatives have resulted in more than $154 million in investments in the environmental sector in Eastern Europe and Eurasia in the period 1999-2003. This represents a private or public investment in the environmental sector of six additional dollars for every one dollar of USAID funding.

EcoLinks achieves trade and investment results in two ways. First, EcoLinks staff provides trade facilitation and market outreach services that help organizations identify potential business partners. When firms and municipalities purchase environmental technologies or services from an EcoLinks partner, they report results to EcoLinks staff involved in project facilitation. Second, grant recipients often seek additional resources to implement follow-on measures as a result of grant-sponsored activities. Projects initiated by EcoLinks have gone on to be implemented or expanded with financing from participating companies, local and regional government contributions, the national environmental funds of the countries concerned, EU investments programs, the Black Sea Investment Bank, the World Bank, and the US Trade and Development Agency.

In **Bulgaria**, for example, Princeton Energy Resources worked with a Municipality of Sapareva Banja to develop a technical and economic model for a geothermal plant. To implement the EcoLinks funded model, the National Trust EcoFund of Bulgaria provided a $55,000 grant to the municipality to extend the geothermal heating system to provide services to a kindergarten and a department store. In **Kazakhstan,** the Atyrau Dairy Plant worked with The Process Safety & Reliability Group (PSRG) of Houston, Texas, to identify economically viable options to reduce ammonia emissions and improve energy efficiency. As a result, the dairy was able to obtain $143,000 from the Almaty Merchant Bank for reconstruction of its refrigeration facilities.



In **Romania**, through an EcoLinks Challenge Grant, a **Hungarian** consulting firm assisted the water utility of Satu Mare to prioritize areas for wastewater infrastructure investments. Following the assessment, Satu Mare invested $3.7 million and leveraged $33.7 million in EU and European Investment Bank financing to improve its water infrastructure. These resources will be used to rehabilitate the wastewater treatment plant, including replacing pipes, purchasing new sludge pressing equipment, and refurbishing the existing pumping stations. In addition, a feasibility study will be prepared for the rehabilitation of the sewage system.

Romania

EcoLinks Environmental Technology Representative Adriana Mircea is stationed in the Commercial Service Office in Bucharest, Romania. Before joining EcoLinks, Ms. Mircea worked at the Romanian Ministry of Environment and Waters, and her extensive contacts in the environmental sector in Romania have been a valuable asset in promoting environmental projects. Ms. Mircea has worked closely with other US agencies active in the environmental sector, including the US Trade and Development Agency and the US Export-Import Bank. Her current priority sectors include water supply, wastewater treatment, and environmental remediation in the mining sector.

"Please accept our gratitude for the opportunity offered by the US Government through EcoLinks to our organizations with occasion of WEFTEC 2002—Chicago—to meet American companies involved in environmental and water industry. We appreciate the support given our delegation through Ms. Adriana Mircea, EcoLinks Representative in Bucharest."

Eng. Napolean Pascu
Deputy General Manager
Steaua Romana Refinery, Romania

Conclusion

Sustainable market-based partnerships are the centerpiece of the EcoLinks environmental assistance model. The EcoLinks program has fostered partnerships between private and public sector organizations to improve environmental infrastructure in Central and Eastern Europe and Eurasia for the past five years. Four important environmental sectors—water, waste management, cleaner production, and climate change—have been the focal point of development assistance. Responding to a critical development challenge, EcoLinks has leveraged resources to help businesses and municipalities identify and address environmental problems through market-based solutions.

Progress toward improved environmental performance has been achieved not by isolated interventions, but through the sustained efforts of regional and US partners from the private sector. Recent reports from EcoLinks partnerships indicate that an overwhelming majority of partners seek to extend and expand their collaboration, leading to further capacity building, technology transfer, and trade and investment in the environment. EcoLinks' full impact in the region will be assessed over the long term, as partnerships created today develop solutions to environmental challenges tomorrow.

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